



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,835	02/14/2001	Dirk Quintens	27500/016	1614

7590 01/12/2006

Joseph T. Guy Ph.D.
Nexsen Pruet Jacobs & Pollard LLP
201 W. McBee Avenue
Greenville, SC 29601

EXAMINER

DICUS, TAMRA

ART UNIT PAPER NUMBER

1774

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,835

Applicant(s)

QUINTENS ET AL.

Examiner

Tamra L. Dicus

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

1. This is a response to the Applicant's paper filed on 10/27/05, which corrected the deficiency indicated in the Notice of Non-Compliant amendment mailed on 10/04/05. Since the previous office action was in error, this office action is being mailed to applicant and is therefore made non-final so that applicant may respond.
2. The amendment to change misnumbered claim 1 (new) to claim 19 is acknowledged, accordingly, the claim objection is withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 5-10, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,238,784 to Mochizuki et al. in view of USPN 6,455,133 to Furukawa et al.
5. Mochizuki discloses an ink-jet recording sheet (element) comprising a support, an ink absorption layer (receiving layer), a porous inorganic pigment of non-crystalline (amorphous) silica, with silica or silicate particles dispersed in a cation-modified polyvinyl acetate, and a styrene-butadiene copolymer or acrylate latex (film-forming polymer) having a glass temperature lower than 50 degrees Celsius (instant claim 6) (see col. 2, line 45-col. 3, line 3; col. 3, line 24-38; col. 4, line 64-col. 5, line 5; col. 5, lines 22-25; col. 6, lines 30-35) (new claim 18). Further, Mochizuki discloses an ink-jet recording sheet (element) comprising a support, an ink absorption

Art Unit: 1774

layer (receiving layer), a porous inorganic pigment of non-crystalline (amorphous) silica, with silica or silicate particles dispersed in a cation-modified polyvinyl acetate at col. 5, lines 5-25 (instant claims 2-3). Mochizuki also shows a styrene-butadiene copolymer or acrylate latex (film-forming polymer) having a glass temperature lower than 50 degrees Celsius (see col. 2, line 45-col. 3, line 3; col. 3, line 24-38; col. 4, line 64-col. 5, line 5; col. 6, lines 30, 34, 35; patented claim 3) (instant claim 7-8).

While Mochizuki teaches conventional various silica including silane and vinyl acetates in ink receiving layers (col.3, lines 30-44, col. 5, lines 5-22 and col. 6, line 10), Mochizuki does not expressly disclose a *hydrolyzed* copolymer of vinylacetate and silane monomer.

Furukawa teaches ink imaging sheets useful in ink jet recording using hydrolyates (hydrolyzed) of copolymers of a vinyl ester such as vinyl acetate in the ink receiving layer. See col. 4, lines 44-50, col. 5, lines 1-3, and col. 6, lines 7-10. Furukawa also uses silane monomers (instant claim 5) and particularly teaches crosslinking monomers of various vinyltrimethoxysilanes at col. 7, lines 23-31 as new claim 17 requires. Further Furukawa discloses using crosslinking monomers in combination of two or more species and lists epoxy-group containing monomers such as glycidyl (metha)acrylate and acryloxypropyltrimethoxysilane, γ -(meth) at col. 7, lines 15 and 46, which would arrive at applicant's new claim 18 of γ -glycidyloxypropyltrimethoxysilane.

It would have been obvious to one of ordinary skill in the art to combine a hydrolyzed copolymer of vinylacetate and silane monomer as instant claims 1, 17, and 18 to the ink jet sheet of Mochizuki because Furukawa employs using aforesaid components for the improvement of ink absorption and fixation (col. 4, lines 47-50 of Furukawa). Both Mochizuki and Furukawa

Art Unit: 1774

references are analogous art because they are in the same field of endeavor, namely ink jet recording sheet/elements.

Mochizuki does not expressly disclose the modification degree range of silanol and the viscosity requirements of the aqueous solution of instant claim 5.

Mochizuki teaches at col. 5, lines 1-25, a modified polyvinyl alcohol made from a copolymer of vinyl acetate and including vinyl acetate from 60% to 100% saponification degree at col. 5, line 20-23 and col. 6, lines 9-10 containing silica particles having a modification degree between 0.1 to 10 mol percent and having an average molecular weight between 5000-10000.

Since Mochizuki produces the same silanol polyvinyl acetate at col. 5, lines 22-25 and col. 6, lines 9-10 having a saponification degree from 60-100%, it is obvious that the modification degree of modified polyvinyl acetate would be expected to exhibit a silanol modification degree between 0.1 to 10 percent and its inherent viscosity properties.

Regarding instant claims 9 and 10, Mochizuki is silent to further comprising a cationic binder (inclusive of "mordant") like that of instant claim 10. Furukawa teaches cationic polymers are conventionally used in the ink-receiving layer, including the one listed in claims 9 and 10 for improving the ink fixation (col. 4, lines 44-50 and col. 12, lines 18-25 and lines 40-45. It would have been obvious to one of ordinary skill in the art to include a cationic binder as instant claims 9 and 10 because Furukawa conventionally employs cationic mordants for ink and dye fixing improving ink absorption within the ink-receiving layer (col. 4, lines 44-50 of Furukawa).

Art Unit: 1774

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,238,784 to Mochizuki et al. in view of USPN 6,455,133 to Furukawa et al. and further in view of USPN 5,853,540 to Niemoller et al.

Mochizuki is relied upon above. Regarding claim 4, Mochizuki does not expressly disclose amorphous silica having the particle size requirements.

Niemoller teaches a water-resistant recording material for an inkjet process where porous silica has the particle size range requirements of claim 4 (see col. 3, line 19).

It would have been obvious to one of ordinary skill in the art to modify the ink jet sheet of Mochizuki in order to produce an ink jet recording element like that of claim 4, for the purpose of providing good absorptivity as taught by Niemoller at col. 3, line 15 for porous pigments, like amorphous silica. Niemoller teaches using cationic mordants also (see col. 3, line 25). Both Mochizuki and Niemoller references are analogous art because they are in the same field of endeavor, namely ink jet recording sheet/elements.

Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,238,784 to Mochizuki et al. in view of USPN 6,455,133 to Furukawa et al. and further in view of USPN 6,022,440 to Nordeen et al.

Mochizuki is relied upon above. With regard to claims 11-13, and 15, Mochizuki is further silent to an ink jet recording element having an adhesive polymer disposed between a support and ink receiving layer. Nordeen teaches an ink jet image composite and the method of making such, including an adhesive polymer disposed between a support and ink receptive (receiving) layer, where the adhesive may be a releasable thermoplastic layer of suitable adhesive polymers such as copolymer styrene-butadiene, acrylics, vinyl acetates (vinyl acetates

Art Unit: 1774

includes vinyl esters), and their combinations at col. 2, lines 33-40 and col. 6, lines 41-55. With regards to claims 12-14, Mochizuki teaches several examples of acrylate latex polymers at col. 6, lines 30-44 including the copolymers of instant claims 12 and 14, and the polyacrylate latex of instant claim 13. It is well known in the art that the copolymers and polymers claimed are adhesive polymers as taught by Nordeen at col. 6, lines 46-55. It would have been obvious to one with ordinary skill in the art to modify the ink jet sheet of Mochizuki to include adhesive polymers and copolymers of acrylate latex such as a copolymer of ethylacrylate-hydroxyethylmethacrylate, and styrene-butadiene as taught by Nordeen in order to produce an ink jet recording element which provides additional assistance for release of the ink receiving layer from the support and provide added protection for a transferred image composite at col. 6, lines 41-46.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,238,784 to Mochizuki et al., as applied to claim 1 above, and further in view of USPN 6,214,458 to Kobayashi et al.

As discussed above, Mochizuki in view of Furukawa expressly discloses the claimed invention. Mochizuki does not expressly disclose an opaque support. Kobayashi teaches an ink jet recording sheet comprising the option of using a high glossy opaque support of polyethylene terephthalate in the Comparison Examples 1 and 2 in order to improve image quality. It would be obvious to a person with ordinary skill in the art to modify the ink jet sheet of Mochizuki to include an opaque support as taught by Kobayashi to produce an ink jet recording element in order to provide further support and improve image quality as cited above.

Claim 19 (new) is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,238,784 to Mochizuki et al. in view of USPN 6,455,133 to Furukawa et al. and further in view of USPN 6,187,430 to Mukoyoshi et al.

Mochizuki discloses an ink-jet recording sheet (element) comprising a support, an ink absorption layer (receiving layer), a porous inorganic pigment of non-crystalline (amorphous) silica, with silica or silicate particles dispersed in a cation-modified polyvinyl acetate, and a styrene-butadiene copolymer or acrylate latex (film-forming polymer) having a glass temperature lower than 50 degrees Celsius (instant claim 19 (new)) (see col. 2, line 45-col. 3, line 3; col. 3, line 24-38; col. 4, line 64-col. 5, line 5; col. 5, lines 22-25; col. 6, lines 30-35). Further, Mochizuki discloses an ink-jet recording sheet (element) comprising a support, an ink absorption layer (receiving layer), a porous inorganic pigment of non-crystalline (amorphous) silica, with silica or silicate particles dispersed in a cation-modified polyvinyl acetate at col. 5, lines 22-25. Mochizuki also shows a styrene-butadiene copolymer or acrylate latex (film-forming polymer) having a glass temperature lower than 50 degrees Celsius (see col. 2, line 45-col. 3, line 3; col. 3, line 24-38; col. 4, line 64-col. 5, line 5; col. 6, lines 30, 34, 35; patented claim 3).

While Mochizuki teaches conventional various silica including silane and vinyl acetates in ink receiving layers (col.3, lines 30-44, col. 5, lines 5-22 and col. 6, line 10), Mochizuki does not expressly disclose a *hydrolyzed* copolymer of vinylacetate and silane monomer.

Furukawa teaches ink imaging sheets useful in ink jet recording using hydrolyates (hydrolyzed) of copolymers of a vinyl ester such as vinyl acetate with polyvinyl alcohol in the ink receiving layer. See col. 5, lines 1-3, col. 6, lines 8-10, and col. 4, lines 44-50. Furukawa also uses silane monomers (instant claim 19 (new)) and particularly teaches crosslinking

Art Unit: 1774

monomers of various vinyltrimethoxysilanes at col. 7, lines 23-31. Further Furukawa discloses using crosslinking monomers in combination of two or more species and lists epoxy-group containing monomers such as glycidyl (metha)acrylate and acryloxypropyltrimethoxysilane, γ -(meth) at col. 7, lines 15 and 46.

It would have been obvious to one of ordinary skill in the art to combine a hydrolyzed copolymer of vinylacetate and silane monomer as instant claim 19 (new) to the ink jet sheet of Mochizuki because Furukawa employs using aforesaid components for the improvement of ink absorption and fixation (col. 4, lines 47-50 of Furukawa). Both Mochizuki and Furukawa references are analogous art because they are in the same field of endeavor, namely ink jet recording sheet/elements.

Mochizuki nor Furukawa teach (d) dimethylamine-epichlorohydrine copolymer (instant claim 19 (new)).

Mukoyoshi teaches an ink jet recording having amorphous silica, styrene-butadiene copolymer and epichlorohydrin-dimethylamine copolymer (dimethylamine-epichlorohydrine copolymer equivalent) at col. 11, lines 30-60 exhibiting an effect of enhancing the water-resistance of printed ink images.

It would have been obvious to one of ordinary skill in the art to include dimethylamine-epichlorohydrine copolymer to the ink jet sheet of Mochizuki and Furukawa because Mukoyoshi teaches an ink jet recording having amorphous silica, styrene-butadiene copolymer and epichlorohydrin-dimethylamine copolymer (dimethylamine-epichlorohydrine copolymer equivalent) for exhibiting an effect of enhancing the water-resistance of printed ink images (Abstract, col. 9, lines 1-40, col. 10, lines 60-68, and col. 11, lines 30-60 of Mukoyoshi).

Art Unit: 1774

Mochizuki, Furukawa and Mukoyoshi are analogous art because they are in the same field of endeavor, namely ink jet recording sheet/elements.

Response to Arguments

Applicant's arguments filed 08-01-05 have been fully considered but they are not persuasive.

Applicant's arguments to the prior art not teaching silane modified polyvinyl alcohol is moot as Applicant has removed this limitation.

Applicant argues Furukawa does not teach a hydrolyzed copolymer of vinylacetate and silane monomer even though the starting components are taught. Applicant has not persuasively argued because Furukawa explicitly teaches a hydrolyzed copolymer of vinylacetate and silane monomer at col. 5, lines 1-3, col. 6, lines 8-10, and col. 4, lines 44-50. Because the same starting components are used, then the resultant product is achieved absent any evidence to the contrary. Further Mochizuki teaches vinyl acetate and silanes used in the ink jet (col. 3, lines 30-44, col. 5, lines 5-24 and col. 6, line 9). Furukawa is used to show hydrolyzed vinyl acetate is an obvious addition. Applicant has failed to submit objective evidence to the contrary and thus the rejection stands.

Applicant argues Furukawa teaches silane as a crosslinker, however, Applicant has not amended the claim to exclude silane as a crosslinker. The same materials are used by both Mochizuki and Furukawa and meet the claimed limitations.

Applicants argue Niemoller is cited for teaching the cationic mordants of claim 10. A

Art Unit: 1774

cationic mordant, dye fixing agent/binder is explicitly taught by Niemoller. See col. 3, line 25.

Further Furukawa also teaches cationic mordants for the same dye fixing properties.

Niemoller is still used to teach the conventional use of amorphous silica having the particle size of instant claim 4.

Applicant argues Nordeen is cited for using an ink jet image and does not provide teaching which overcome the deficiencies of Mochizuki. The reference of Mochizuki and Nordeen uses a silicon material(s) in preparation of ink systems, e.g. see column 6, lines 5, 42 of Mochizuki and col. 4, lines 52 of Nordeen. Again, a hydrolyzed vinyl acetate and silane monomer is now provided for by Furukawa as set forth above.

Applicant also argues the use of Kobayashi as not providing a teaching for mitigating the deficiencies of Mochizuki. Kobayashi was used to teach an ink jet recording sheet comprising the option of using a high glossy opaque support (as applicant claims) of polyethylene terephthalate in the Comparison Examples 1 and 2 in order to improve image quality. As aforesaid, a hydrolyzed vinyl acetate and silane monomer is now provided for by Furukawa as set forth above.

New claim 1 or properly claim 19, contains a new limitation to dimethylamine-epichlorohydrine copolymer, and thus a new reference, Mukoyoshi is used to teach this inclusion.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 6500525 to Ogino et al. teaches a recording medium using hydrolyzed vinyl acetate and silicon groups.

Art Unit: 1774

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamra L. Dicus whose telephone number is 571-272-1519. The examiner can normally be reached on Monday-Friday, 7:00-4:30 p.m., alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tamra L. Dicus
Examiner
Art Unit 1774

January 7, 2006



RENA DYE
SUPERVISORY PATENT EXAMINER

A.U. 1774 1/9/06